

CLAIMS

What is claimed is:

- [1] A gallium-nitride semiconductor substrate, characterized in that metal contamination on the substrate surface is 10×10^{11} atoms/cm² or less.
- [2] A gallium-nitride semiconductor substrate, characterized in that metal contamination on the substrate surface is 5×10^{11} atoms/cm² or less.
- [3] A method of manufacturing a gallium-nitride semiconductor substrate, characterized in that in order to remove a process-transformed layer resulting from polishing, dry etching using a halogen plasma is carried out; and wet etching by means of an etchant having no Ga-face and N-face selectivity, having etching ability, and having an oxidation-reduction potential of 1.2 V or more is carried out; whereby contaminant metal produced by the dry etching is removed.
- [4] A method of manufacturing a gallium-nitride semiconductor substrate, characterized in that wet etching by means of an etchant that is one of HF + H₂O₂, HCl + H₂O₂, H₂SO₄ + H₂O₂, HNO₃ + H₂O₂, HF + O₃, HCl + O₃, H₂SO₄ + O₃, HNO₃, or HNO₃ + O₃, and that has an oxidation-reduction potential of 1.2 V or more is carried out.
- [5] A method of manufacturing a gallium-nitride semiconductor substrate as set forth in claim 3 or 4, characterized in that a wash for taking off organic matter by means of an organic solvent, and a wash by means of an alkaline solution in order to take off nonmetal contaminants are carried out either before or after the wet etching.